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 1. 2/34/1 (Item 1 from file: 351)

007277686

WPI Acc No: 1987-274693/ 198739

Hair tonic cosmetic material - comprises blend of pentoxyphylline or oxohexyl-theobromine

Patent Assignee: KANEBO LTD (KANE )

Number of Countries: 001 Number of Patents: 002

Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week
JP 62192311	A	19870822	JP 8634490	A	19860218	198739 B
JP 92045488	B	19920727	JP 8634490	A	19860218	199234

Priority Applications (No Type Date): JP 8634490 A 19860218

Patent Details:

Patent No Kind Lan Pg Main IPC Filing Notes

JP 62192311 A 6

JP 92045488 B 6 A61K-007/06 Based on patent JP 62192311

Abstract (Basic): JP 62192311 A

Cosmetic is pred. by blending pentoxyphyrrin, or 1-(5-oxohexyl) theobromine. The cpd. has effects of promoting the blood circulation, activating the skin tissues, and prevents loss of hair and dandruff.

USE - For providing hair tonic material with effects of durably promoting the circulation and preventing loss of hair and dandruff.

0/0

Derwent Class: D21; E19

International Patent Class (Main): A61K-007/06

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 2. 2/34/2 (Item 2 from file: 347)

02275411 \*\*Image available\*\*

HAIR TONIC COSMETIC

Pub. No.: 62-192311 A ]

Published: August 22, 1987 (19870822)

Inventor: MIYAMOTO TATSU

SHOJI KAZUHISA

Applicant: KANEBO LTD [000095] (A Japanese Company or Corporation), JP

(Japan)

Application No.: 61-034490 [JP 8634490]

Filed: February 18, 1986 (19860218)

International Class: [ 4 ] A61K-007/06

JAPIO Class: 14.4 (ORGANIC CHEMISTRY -- Medicine); 14.1 (ORGANIC CHEMISTRY -- Organic Compounds)

Journal: Section: C, Section No. 475, Vol. 12, No. 47, Pg. 5, February 12, 1988 (19880212)

## ABSTRACT

PURPOSE: A hair tonic cosmetic, obtained by blending pentoxifylline in a hair tonic cosmetic, capable of sustainedly promoting the blood circulation of scalp and having improved effect on hair growth, prevention of depilation and dandruff.

CONSTITUTION: A hair tonic cosmetic, obtained by blending a compound expressed by the formula (278.31 molecular weight and 104-106 deg.C melting point) in an amount of 0.05-1.0wt% based on the total weight in a hair cosmetic, rapidly absorbable in the scalp when applied to the scalp, capable of sustaining the effective concentration of the drug in the scalp and having low skin irritancy. The compound is capable of preventing hemocytolysis, smoothly promoting microcirculation of blood in the scalp, activating the scalp tissue and preventing depilation and dandruff and further has metabolic improving effect of the skin by increasing adenosine triphosphate (ATP) and cyclic adenosine monophosphate (AMP) in scalp cells. The formulation form includes hair tonic, hair lotion, hair cream, etc. A dyestuff, perfume, germicide, preservative, keratolytic agent, etc., are suitably blended, as necessary.

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3.

2/34/3 (Item 3 from file: 345)

6192872

Basic Patent (No,Kind,Date): JP 62192311 A2 870822

PATENT FAMILY:

JAPAN (JP)

Patent (No,Kind,Date): JP 62192311 A2 870822

HAIR TONIC COSMETIC (English)  
Patent Assignee: KANEBO LTD  
Author (Inventor): MIYAMOTO TATSU; SHOJI KAZUHISA  
Priority (No,Kind,Date): JP 8634490 A 860218  
Applc (No,Kind,Date): JP 8634490 A 860218  
IPC: \* A61K-007/06  
CA Abstract No: ; 107(26)242436S  
Derwent WPI Acc No: ; C 87-274693  
JAPIO Reference No: ; 120047C000005  
Language of Document: Japanese  
Patent (No,Kind,Date): JP 92045488 B4 920727  
Patent Assignee: KANEBO LTD  
Author (Inventor): MYAMOTO TATSU; SHOJI KAZUHISA  
Priority (No,Kind,Date): JP 8634490 A 860218  
Applc (No,Kind,Date): JP 8634490 A 860218  
IPC: \* A61K-007/06  
Language of Document: Japanese

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## ⑫ 公開特許公報 (A) 昭62-192311

⑩ Int.Cl.<sup>4</sup>  
A 61 K 7/06識別記号 庁内整理番号  
7306-4C

⑬ 公開 昭和62年(1987)8月22日

審査請求 未請求 発明の数 1 (全6頁)

④ 発明の名称 養毛化粧料

⑤ 特願 昭61-34490  
⑥ 出願 昭61(1986)2月18日⑦ 発明者 宮本達 平塚市八重咲町19番23-204号  
⑧ 発明者 庄司和壽 藤沢市辻堂新町1-2番4-302  
⑨ 出願人 鐘紡株式会社 東京都墨田区墨田5丁目17番4号

## 明細書

## 1. 発明の名称

養毛化粧料

## 2. 特許請求の範囲

ペントキシフィリンを配合してなる養毛化粧料。

## 3. 発明の詳細な説明

## (技術分野)

本発明は、ペントキシフィリンを配合してなる養毛化粧料に関するもので、詳しくは、頭皮の血行を持続的に促進し育毛効果、脱毛予防効果及びふけ防止効果に優れた養毛化粧料に関するものである。

## (従来の技術)

従来より、トウガラシチンキ、センブリエキス、朝鮮ニンジンエキス、ニコチニ酸、ニコチニ酸メチル等の頭皮の血行促進物質を配合してなる養毛化粧料は知られている。

しかし、これらの血行促進物質は、皮膚刺激が強くその配合量に制約が生じるものであったり、血行促進作用が短時間に減少するものまたは血行

促進作用が弱いものであり、育毛、脱毛防止、ふけ防止等の効果を充分に発現する程に有効なる物質ではなかった。

## (発明の開示)

そこで本発明者等は、養毛化粧料に配合して有効なる血行促進物質に関して観察研究した結果、ペントキシフィリンを配合してなる養毛化粧料は、皮膚刺激性が低く頭皮の血行を持続的に促進し、育毛、脱毛予防及びふけ防止等に優れた効果を有することを見出し本発明を完成するに至った。

## (発明の目的)

即ち、本発明の目的は、頭皮の血行を持続的に促進し、育毛、脱毛予防及びふけ防止等の効果に優れた養毛化粧料を提供するにある。

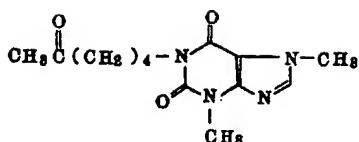
## (発明の構成)

本発明は、ペントキシフィリンを配合してなる養毛化粧料である。

## (構成の具体的な説明)

本発明に用いるペントキシフィリン公知の物質であり、化学構造等は下記の通りである。

## (1) 構造:



(2) 化学名: 1-(5-オキソヘキシル)テオブロミン

1-(5-oxohexyl)theobromine

(3) 分子式: C<sub>18</sub>H<sub>18</sub>N<sub>4</sub>O<sub>8</sub>

(4) 分子量: 278.31

(5) 融点: 104~106°C

本発明に用いるペントキシフィリンを被毛化粧料中に配合し、頭皮に塗布した場合には、速に皮膚に吸収され、頭皮内における該薬物の有効濃度を持続するものであり、かつ皮膚刺激性も低い。

- (1) 血球の変形態を防止し、
- (2) 頭皮の微小血流を円滑に促進し、
- (3) 頭皮組織を賦活し、

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本発明の被毛化粧料には、色素、香料、殺菌剤、防腐剤、角質溶解剤、抗アンドロゲン剤、整毛剤、抗酸化剤等を本発明の目的を達成する範囲内で適宜配合することができる。

## (実施例)

以下、実施例及び比較例に基づいて本発明を詳説する。

尚、実施例に記載の皮膚血流量試験法、マウス毛成長促進効果試験法、ヒト頭髪毛成長促進効果試験法及び実用試験法を下記に示す。

## (1) 皮膚血流量試験

ニュージーランドホワイト系家兔3羽の腹部を刈毛し、18時間絶食させた後、ペントバルビトールのナトリウム塩を35mg/kgの割合で静脈注射し麻酔処置する。家兔の背部を固定し、プレートタイプトランスジューサーを腹部の試験部位（試験部位）上にセロファンテープでとめ、交叉熱電堆式皮膚血流計（シンエイ社製シンコーダー、201型）を用いて皮膚血流量（μV）を測定する。

## (4) 脱毛を防止し、

## (5) ふけを防ぐ

という薬理効果を頭皮局部において発揮する。また、本発明に用いるペントキシフィリンは頭皮細胞中のATP及びサイクリックAMPの増加させることによる皮膚の代謝改効果をも有している。この持続的な血行促進作用が、毛母細胞を不活して優れた育毛、脱毛予防効果を発現し、更には頭皮代謝機能を正常化してふけ防止効果を高めるものと推察される。

ペントキシフィリンの配合量は、本発明の被毛化粧料の組成物の全重量に対して0.05~1.0重量%（以下wt%と略記する）であればよく、好みしくは0.1~0.7wt%である。配合量が0.05wt%未満では、本発明の目的とする効果に充分でなく、一方1.0wt%を超えて、その增加分に見合った効果の向上は認めないものである。

本発明の被毛化粧料は、常法に従って、ヘアーテニック、ヘアーローション、ヘアークリーム等の瓶型にすることが可能である。

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試料は3×2cmの皮膚部位に対して0.1gを均一に塗布し、試料塗布前の血流量（C<sub>B</sub>）と試料塗布後一定時間後（0.5、1.0、2.0時間後）の血流量（C<sub>t</sub>）を測定し、下記の式により血流量増加率（%）を算出する。

試験結果は3羽の血流量増加率の平均値で示した。

$$\text{血流量増加率} (\%) = \frac{C_t - C_B}{C_B} \times 100$$

クリーム基剤を試料として塗布した場合でも5~20%程度の血流量増加率が認められるが、血行促進作用の顕著な成分を配合した試料を塗布したときは、40~80%のごとく増加率は高くなる。

## (2) マウス毛成長促進効果試験

ddY系白色マウス（雄・6週齢・平均体重35g）の尾部よりの背部皮膚を電気バリカンで刈った後、脱毛クリームにより完全に除毛し、翌日より実施例及び比較例の各試料を被験部皮膚に毎日朝夕2回、一匹当たり0.1ml塗布した。一試

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料に対して動物は一群10匹使用した。

養毛効果の判定は、下表に示す判定基準による肉眼判定の評価点と、毛長、毛重量を対照群と比較することにより行った。

実験開始後15日目に動物を屠殺し判定基準により肉眼判定し、その評価点を合計し、一匹当たりの平均評価点を求めた。さらに、被験部の皮膚を切除し、直径12mmのパンチで一定面積の皮膚を打ち抜き乾燥した後、毛の重量を測定し、その中の20本の毛の長さについても測定し、各々の平均値で示した。

#### 養毛効果の評価点の判定基準

評価点	判定基準
5	周囲の非抜毛部との境界が不明
4	毛成長強度
3	毛成長中等度
2	毛成長軽度
1	毛成長極く軽度
0	毛成長認められず

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数で示した。

#### 実施例1～4、比較例1～4

(オイリーヘアートニック)

下記の原料組成に於いて、第1表に記載のごとく各種頭皮血行促進物質を配合して各々のヘアートニックを開発し、前記の諸試験を実施した。

尚、皮膚血流量試験では試料塗布0.5、1.0、2.0時間後の各々の血流量増加率を測定した。

(以下省略)

#### (3) ヒト頭髪毛成長促進効果試験

男性型脱毛症患者である被験者10名の頭部の耳の上5cmの位置の頭髪を左右2ヶ所に於て直径1cmの円形状に剃毛した被験部位に、実施例または比較例の試料を左側に毎日朝夕2回、約3ml塗布し、無処置の右側と比較した。効果の判定は、試験開始後28日に、左右の被験部位の毛髪各々20本ずつを剃毛し、左側(実施例または比較例を塗布)の毛20本の長さの平均値(B)を右側(無処置)の毛20本の長さの平均値(A)で除した値を求めて評価した。

判定結果は、被験者10名の(B/A)の平均値で示した。

#### (4) 実用試験

男性型脱毛症患者である被験者20名の頭部に毎日朝夕2回、連続6ヶ月間塗布した後の効果を評価した。試験結果は、育毛効果、脱毛予防効果、ふけ防止効果の各項に対して、「生毛が剛毛化した或いは生毛が増加した」、「脱毛が少なくなった」、「ふけが少なくなった」と回答した人

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#### (1) 組成

原 料 成 分		配合量 wt%
(A)	○ 血行促進物質	第1表に記載
(B)	○ オリーブ油	5.0
	○ イソプロピルミリストート	2.0
	○ イソプロピルメチルフェノール	0.05
	○ (S)オキシズチレン/ニルフェニルエーテル	0.5
(C)	○ メチルパラベン	0.1
	○ エタノール	6.00
	○ グリセリン	5.0
	○ D-パンテノール	0.2
	○ 香料	0.1
	○ 精製水	総量 100.0wt%とする残量

#### (2) 製法

(A) 成分の内、トウガラシチンキを(C)成分中に溶解し、他の成分を(B)成分中に溶解して、(B)、(C)成

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分を各々均一に溶解した。次いで(B)成分と(C)成分を混合攪拌分散した後、容器に充填する。使用時には内容物を均一に混ぜ分散して使用する。

## (3) 特 性

各オイリーヘアートニックの諸試験を実施した結果を第1表右欄に記載した。

第1表に示すごとく、比較例1～4は血流量増加率が低いかまたは時間を経るに従って血流量増加率が低減するものであった。また、比較例2～4は皮膚刺激があり、ヒト皮膚での試験は不可能であった。

実施例1～4の本発明の養毛化粧料は諸試験の総てに亘って明らかに良好な結果を示した。

尚、実施例1～4はヒト皮膚での諸試験に於いて皮膚刺激は生じなかった。

## 実施例5～7、比較例5～7

## (ヘアークリーム)

実施例1と同様にして各々のヘアークリームを調製して諸試験を実施し、その結果を第1表右欄に記載した。

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## (1) 製 成

原 料 成 分		配合量 wt%
(A)	○ 血 行 促 進 物 質	第1表に記載
(B)	○ 流動パラフィン	30.0
	○ ステアリン酸	5.0
	○ セタノール	5.0
	○ ソルビタンモノオレート	8.0
	○ ボードキシペチレンカルクタンモノオレート	8.0
	○ イソプロピルメチルフェノール	0.1
(C)	○ メチルパラベン	0.2
	○ グリセリン	5.0
	○ D-パンテノール	0.1
	○ 精 製 水	残量
(D)	○ 香 料	0.2

## (2) 調製法

(A)成分の内、トウガラシチンキを(C)成分中に溶

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解し、他の成分を(B)成分中に溶解或いは分散して、(B)、(C)成分を各々温度80℃に加熱溶解した。次いで(B)、(C)成分を混合した後、攪拌しつつ冷却して温度50℃になったところで(D)成分を加え、更に温度を30℃まで攪拌を続けて各ヘアークリームを調製した。

## (3) 特 性

第1表に示すごとく、本発明の養毛化粧料である実施例5～7の養毛化粧料は、比較例5～7と比較して持続的な血流量増加率を示すと共に諸試験に於いて優れた効果を示し、ペントキシフィリンの配合量は0.05～1.0wt%の範囲で本発明の目的を達成し得るものであった。

(以 下 略 )

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	血行促進物質 (配合量 wt%)	血流量増加率 (%)		マウス毛成長促進		ヒト頭髪毛 成長促進		实用試験 (人)	
		(0.5hr) (1.0hr)	(2.0hr)	毛量 (mm)	毛重量 (mg)	新髪点	育毛	脱毛予防	毛防
<b>比較例1</b>									
" 2	ニコチン酸 (0.2)	13	8	6	5.18	4.84	2.9	0.98	3 4 4
" 3	ニコチン酸メル (0.2)	93	76	39	5.43	6.52	8.2 (実施不可)	(同左)	(同左)
" 4	トウガラシチンキ (0.2)	95	82	46	5.60	5.73	8.6 ("")	("")	("")
<b>実施例1</b>									
" 2	ペントキシフィリン (0.05)	58	57	55	6.25	5.91	8.5	1.18	9 1.4 1.5
" 3	" (0.7)	41	40	36	5.94	5.86	8.3	1.10	8 1.2 1.2
" 4	" (1.0)	64	64	58	6.30	6.21	8.9	1.19	1.2 1.4 1.6
<b>比較例5</b>									
" 6	ニコチン酸 (0.05)	17	14	9	5.24	4.93	2.9	1.00	4 4 5
" 7	トウガラシチンキ (0.05)	69	47	23	5.36	5.40	8.0	1.10	5 4 6
<b>実施例5</b>									
" 6	ペントキシフィリン (0.05)	54	39	23	5.21	5.30	8.1	1.08	4 5 6
" 7	" (1.0)	63	61	59	6.42	6.40	8.8	1.23	1.3 1.5 1.5

(発明の効果)

以上記載のごとく、本発明は、頭皮の血行を  
統的に促進し、育毛、脱毛予防及びふけ防止等の  
効果に優れると共に、皮膚刺激の無い毛化粧料  
を提供することは明らかである。

特許出願人

鐘 紗 株 式 会 社



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PTO 03- [5409]

Japanese Patent

Sho 62-192311

**HAIR GROWTH COSMETIC**

[Yomo Keshoryo]

Toru Miyamoto and Kazuyoshi Atsushi

UNITED STATES PATENT AND TRADEMARK OFFICE

Washington, D.C.

September 2003

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Applicant : Kanebo, Ltd.  
IPC : A 61 K 7/06  
Application Date : February 18, 1986  
Publication Date : August 22, 1987  
Foreign Language Title : Yomo Keshoryo  
English Title : HAIR GROWTH COSMETIC

Specification

1. Title of the invention

Hair Growth Cosmetic

2. Claim

A hair growth cosmetic, characterized by being constituted by mixing a pentoxyphilin.

3. Detailed explanation of the invention

(Technical field)

The present invention pertains to a hair growth cosmetic being constituted by mixing pentoxyphilin. Specifically, the present invention pertains to a hair growth cosmetic that persistently accelerates the blood circulates of the scalp and has excellent hair growth effect, depilation prevention effect, and dandruff prevention effect.

(Prior art)

Hair growth cosmetics being constituted by mixing blood circulation accelerating substances of the scalp such as pepper

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<sup>1</sup> Numbers in the margin indicate pagination in the foreign text.

tincture, Japanese green gentian extract, ginseng extract, nicotinic acid, and methyl nicotinate have been known.

However, these blood circulation accelerating substances are strong in the skin irritation and cause a limitation in their amount being mixed, or the blood circulation acceleration action is reduced in a short time, or the blood circulation acceleration action is weak. They are not substances effective for sufficiently exerting hair growth effect, depilation prevention effect, dandruff prevention effect, etc.

(Presentation of the invention)

Accordingly, these inventors earnestly researched blood circulation accelerating substances being effective by mixing with hair growth cosmetic. As a result, it was discovered that the hair growth cosmetic being constituted by mixing pentoxyphilin had a low skin irritation, persistently accelerated the blood circulation of the scalp, and were excellent in hair growth, depilation prevention, dandruff prevention, etc. Then, the present invention was completed.

(Purpose of the invention)

In other words, the purpose of the present invention is to provide a hair growth cosmetic that persistently accelerates the blood circulation of the scalp.

(Constitution of the invention)

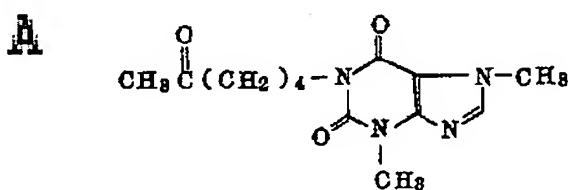
The present invention pertains to a hair growth cosmetic being constituted by mixing pentoxyphillin.

(Detailed explanation of constitution)

The pentoxyphillin being used in the present invention is a well-known substance, and its chemical structure, etc., are as follows.

(1) Structure:

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(2) Chemical name: 1-(5-oxohexyl)theobromine

(3) Molecular formula: C<sub>13</sub>H<sub>18</sub>N<sub>4</sub>O<sub>3</sub>

(4) Molecular weight: 278.31

(5) Melting point: 104-106°C

In case the pentoxyphillin being used in the present invention is mixed into a hair growth cosmetic and spread on the scalp, it is rapidly absorbed by the skin, the effective concentration of said drug in the scalp is sustained, and the skin stimulation is also low.

Pharmacological effects such as (1) prevention of a deformation and transformation of blood cells, (2) smooth acceleration of a fine blood flow of the scalp, (3) activation of the scalp tissue, (4) prevention of depilation, and (5) prevention of dandruffs are locally exerted in the scalp.

Also, the pentoxyphillin being used in the present invention has a metabolism improvement effect of the skin by increasing ATP and cyclic AMP in the scalp cells. This persistent blood circulation acceleration action exerts excellent hair growth and depilation prevention effects by activating the hair mother cells and raises the dandruff prevention effect by normalizing the metabolic function of the scalp.

The amount of pentoxyphillin being mixed may be 0.05-1.0 weight % (hereinafter, abbreviated to wt%), preferably 0.1-0.7 wt% to the total weight of the composition of the hair growth cosmetic of the present invention. If the amount being mixed is less than 0.05 wt%, intended effects of the present invention are not sufficient, whereas even if the amount exceeds 1.0 wt%, the improvement of the effects matched with the increase portion cannot be expected.

The hair growth cosmetic of the present invention can be formulated into hair tonic, hair lotion, hair cream, etc., according to ordinary methods.

In the hair growth cosmetic of the present invention, pigment, perfume, sterilizer, antiseptic, corneal dissolver, antiandrogen agent, hair growth agent, antioxidant, etc., can be appropriately mixed in the range where the purpose of the present invention can be achieved.

(Application examples)

Next, the present invention is explained based on application examples and comparative examples.

Also, skin blood flow testing method, mouse hair growth acceleration effect testing method, human head hair growth acceleration effect testing method, and practical testing method described in the application examples are shown below.

(1) Skin blood flow test

The hairs of the abdomen of three New Zealand white group tame rabbits were cut, and after the rabbits had not been fed for 18 h, a sodium salt of pentobarbital was intravenously injected at a ratio of 35 mg/kg and anesthetized. The back of the tame rabbits was fixed, and a plate type transducer was fixed with a cellophane tape on a sample spreading part (testing part) of the abdomen, and the skin blood flow ( $\mu$ V) was measured using a cross thermopile type skin blood flowmeter (Shincoder [transliteration] made by Shinei K.K., 201 type).

0.1 g sample was uniformly spread on the skin part of 3 x 2 cm, and the blood flow ( $C_B$ ) before spreading the sample and the blood flow ( $C_t$ ) after a fixed time (after 0.5, 1.0, and 2.0 h) from the moment of the sample spreading were measured. The blow flow increase rate (%) was calculated by the following equation.

The testing results were shown by the average value of the blood flow increase rate of three rabbits.

$$\text{Blood flow increase rate (\%)} = C_t - C_B / C_B \times 100$$

Even if a cream base agent was spread as a sample, the blood flow increase rate of about 5-20% was recognized, however when a sample mixed with a component having a distinct blood circulation acceleration action was spread, the increase rate was raised by 40-80%.

## (2) Mouse hair growth acceleration effect test

The back skin from the tail of ddY group white mice (males, 6 years of age, and an average weight of 35 g) was cut by an electric hair clipper, and the hairs were completely removed by a depilatory cream. From the next day, each sample of the application examples and the comparative examples was spread at 0.1 ml twice in the morning and evening daily per mouse on the skin of the part being tested. For one sample, 10 animals as /3 one group were used.

The hair growth effect was decided by comparing the evaluation points of a naked-eye decision based on the decision standards shown in the following table, the hair length, and the hair weight with a control group.

After starting the experiment, the animals were slaughtered on the 15<sup>th</sup> day and decided with the naked eyes based on the decisionA standards, the evaluation points were totaled, and the average evaluation point for one animal was attained. Furthermore, the skin of the part being tested was cut out, and the skin with a fixed area was punched out by a punch with a diameter of 12 mm and dried. The weight of the hairs was measured, and the length of 20 pieces of hairs among them was also measured. Each of them was shown by its average value.

Decision standards of the evaluation points of the hair growth effect

① 評価点	判 定 基 準 ②
5	周囲の非拔毛部との境界が不明 ③
4	毛成長強度 ④
3	毛成長中等度 ⑤
2	毛成長軽度 ⑥
1	毛成長極く軽度 ⑦
0	毛成長認められず ⑧

#### 1. Evaluation point

2. Decision standards
3. The boundary with the peripheral non-punched hair part was indistinct.
4. Hair growth strength
5. Intermediate hair growth
6. Slight hair growth
7. Very slight hair growth
8. No hair growth is recognized.

(3) Human hair growth acceleration effect test

The samples of the application examples and the comparative examples were spread at about 2 ml in the morning and evening daily twice on the part being tested in which the hairs at a position of 5 cm from the top of the ear of the head of 10 testee as male patients with a depilatory disease were cut at two left and right positions in a circular shape with a diameter of 1 cm and compared with the untreated right side. For the decision of the effect, 20 pieces each of the hairs of the left and right tested parts were cut on the 28<sup>th</sup> day after the test start, and the average value (B) of the length of 20 pieces of hairs of the left side (the application examples or comparative

examples were spread) was divided by the average value (A) of the length of 20 pieces of hairs of the right side (untreated). The effect was evaluated by this value.

The decision results were shown by the average values of (B) / (A) of 10 testees.

#### (4) Practical test

The samples were continuously spread for 6 months in the morning and evening daily twice on the heads of 20 testees as male patients with a depilatory disease, and the effect was evaluated. The test results were shown by the number of person who answered "the raw hairs were changed to bristles or the raw hairs were increased," "the depilation was reduced," and "dandruffs were reduced" for each item of the hair growth effect, the depilation prevention effect, and the dandruff prevention effect.

Application Examples 1-4 and Comparative Examples 1-4  
(Oily hair tonic)

In the following raw material compositions, as described in Table I, various kinds of scalp blood circulation accelerators were mixed, so that each hair tonic was prepared. Then, the above-mentioned tests were applied to them.

Also, in the skin blood flow test, each blood flow increase rate after 0.5, 1.0, and 2.0 h from the moment of the sample spreading was measured.

(1) Composition

	①	②	
(A)	原 料 成 分 ○ 血 行 促 進 物 質 ③	配 合 量 wt%	④
(B)	○ オリーブ油 ⑤	5.0	
	○ イソプロピルミリストート ⑥	2.0	
	○ イソプロピルメチルフェノール ⑦	0.05	
	○ ポリオキシエチレンノニルフェニルエーテル ⑧	0.5	
(C)	○ メチルパラベン ⑨	0.1	
	○ エタノール ⑩	6.00	
	○ グリセリン ⑪	5.0	
	○ D-パンチノール ⑫	0.2	
	○ 香 料 ⑬	0.1	
	○ 精 製 水 ⑭	投量 100.0wt% とする換算	

1. Raw material component
2. Amount mixed, wt%
3. Blood circulation accelerator
4. Described in Table I.
5. Olive oil
6. Isopropyl myristate
7. Isopropyl methyl phenol
8. Polyoxyethylene nonylphenyl ether

9. Methylparaben
10. Ethanol
11. Glycerin
12. D-pantenol
13. Perfume
14. Purified water
15. Balance for adjusting the total amount to 100.wt%

(2) Preparation method

Pepper tincture among the components (A) was dissolved in the component (C), and the other components were dissolved in the component (B). The components (B) and (C) were respectively uniformly dissolved. Next, the components (B) and (C) were mixed, stirred, dispersed, and filled into a container. When it was in use, the contents were uniformly shaken and dispersed.

(3) Characteristics

The test results of each oily hair tonic were described in the right column of Table I.

As shown in Table I, in Comparative Examples 1-4, the blood flow increase rate was low, or the blood flow increase rate was lowered with time. Also, in Comparative Examples 2-4, there was a skin irritation, and the test in the human skin was impossible.

The hair growth cosmetics of the present invention of Application Examples 1-4 apparently exhibited good results for all the tests.

Also, in Application Examples 1-4, the skin irritation was not caused in the tests of the human skin.

Application Examples 5-7 and Comparative Examples 5-7  
(Hair cream)

Similarly to Application Example 1, each hair cream was prepared and subjected to the tests, and the results were described in the right column of Table I.

(1) Composition

	①	②	④
	原 料 成 分	配合量 wt%	
(A) ○ 血 行 促 進 物 質 ③		第1表に記載	
	○ 流動パラフィン ⑤	30.0	
	○ ステアリン酸 ⑥	5.0	
(B)	○ セタノール ⑦	5.0	
	○ ソルビタンモノオレート ⑧	8.0	
	○ ボルキシエチレンノルピクタンモノオレート ⑨	8.0	
	○ イソプロピルメチルフェノール ⑩	0.1	
(C)	○ メチルパラベン ⑪	0.2	
	○ グリセリン ⑫	5.0	
	○ D-パンチノール ⑬	0.1	
	○ 精 製 水 ⑭	残量	⑯
(D)	○ 香 料 ⑮	0.2	

1. Raw material component
2. Amount mixed, wt%
3. Blood circulation accelerator
4. Described in Table I.
5. Flow paraffin
6. Stearic acid
7. Cetanol
8. Sorbitan monooleate
9. Polyoxyethylene sorbitan monooleate
10. Isopropyl methyl phenol
11. Methylparaben
12. Glycerin
13. D-pantenol
14. Purified water
15. Perfume
16. Balance

(2) Preparation method

Pepper tincture among the components (A) was dissolved in the component (C), and the other components were dissolved or dispersed in the component (B). The components (B) and (C) were respectively uniformly dissolved by heating at a temperature of

80°C. Next, the components (B) and (C) were mixed and cooled while stirring, and when the temperature reached 50°C, the component (D) was added to it and continuously stirred until the temperature reached 30°C, so that each hair cream was prepared.

### (3) Characteristics

As shown Table I, the hair growth cosmetics of Application Examples 5-7 as the hair growth cosmetics of the present invention showed a persistent blood flow increase rate and exhibited excellent effects in the tests, compared with Comparative Examples 5-7. The amount of pentoxyphilin mixed was in a range 0.05-1.0 wt%, and the purpose of the present invention could be achieved.

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②	血行促進物質 (配合量 wt%)	血流量増加率(%) (0.5hr) (1.0hr) (20hr)	マクス毛成長促進			ヒト頭髪毛 成長促進③	青毛 脱毛平衡	抜け防止 試験値
			毛量 (mm)	毛量 (mg)	評価点			
<b>比較例1</b>								
〃 2	ニコチン酸 ⑥	(0.2)	1.3	8	6	5.18	4.84	2.9
〃 3	ニコチン酸メチル ⑦	(0.2)	9.3	7.6	3.9	5.43	6.52	8.2 (実施不可)
〃 4	トウガラシシンキ ⑧	(0.2)	9.5	8.2	4.6	5.60	5.73	8.6 (〃)
<b>実施例1</b> ペントキシフィリン (0.2)								
〃 2	〃 ⑨ (0.05)	4.1	4.0	3.6	5.94	5.86	8.3	⑩ 3 (同左)
〃 3	〃	(0.7)	6.4	5.8	6.30	6.21	8.9	1.1.8 (〃)
〃 4	〃	(1.0)	6.5	6.1	6.41	6.54	4.0	1.1.8 (〃)
<b>比較例5</b>								
〃 6	ニコチン酸 ⑩ (0.05)	6.9	4.7	2.3	5.24	4.93	2.9	1.0.0 (〃)
〃 7	トウガラシシンキ ⑪ (0.05)	5.4	3.9	2.3	5.21	6.30	8.1	1.0.8 (〃)
<b>実施例5</b> ペントキシフィリン (0.05)								
〃 6	〃 ⑫ (0.2)	4.0	3.7	3.5	5.98	6.04	8.3	1.1.5 (〃)
〃 7	〃	5.6	5.4	5.0	6.12	6.30	8.5	1.2.0 (〃)

1. Blood circulation accelerator (amount mixed, wt%)
2. Blood flow increase rate (%)
3. Mouse hair growth acceleration
4. Human hair growth acceleration
5. Practical test (person)
6. Hair length (mm)
7. Hair weight (mg)
8. Evaluation point
9. Hair growth
10. Depilation prevention
11. Dandruff prevention
12. Comparative Example 1
13. Application Example 1
14. Comparative Example 5
15. Application Example 5
16. Nicotinic acid
17. Methyl nicotinate
18. Pepper tincture
19. Pentoxyphilin
20. Nicotinic acid
21. Pepper tincture
22. Pentoxyphilin
23. Impossible application

24. Same as the left

(Effects of the invention)

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As described above, it is apparent that the present invention provides a hair growth cosmetic that persistently accelerates the blood circulation of the scalp, is excellent in hair growth, depilation prevention, and dandruff prevention effects, and has no skin irritation.